JRW
AF

PTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	41

Application Number	10/613,433
Filing Date	7/3/2003
First Named Inventor	Martinez et al.
Art Unit	2831
Examiner Name	William Mayo
Attorney Docket Number	MX/JFServ-001

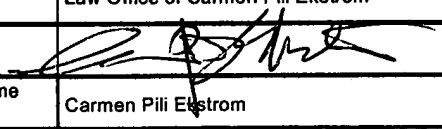
ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation
- ☐ Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☑ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

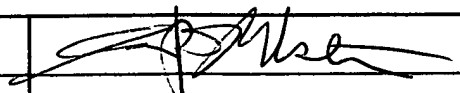
Responsive to OA dated 2/21/06.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Law Office of Carmen Pili Ekstrom		
Signature			
Printed name	Carmen Pili Ekstrom		
Date	3/21/06	Reg. No.	34981

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Carmen Pili Ekstrom	Date	3/21/06

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Assistant Commissioner for Patents, P.O. Box 1450 Alexandria, VA22313-1450 on 3/21/06. By _____ Printed: Carmen Pili Ekstrom

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Leonel Yanez MARTINEZ et al.	)	
	)	
	)	
Serial No. 10/613,433	)	Group Art Unit: 2831
	)	
Filed: JULY 3, 2003	)	Examiner: William Mayo II
	)	
Title:**DRY WATER RESISTANT COAXIAL CABLE AND METHOD OF MANUFACTURE THEREOF**	)	**APPELLANTS' BRIEF UNDER 37 C.F.R. §41.37**
	)	
	)	
Docket No. MX/JFServ-001	)	

Assistant Commissioner for Patents
Washington D.C. 20231

Sir:

The following is Appellants' Brief submitted in triplicate pursuant to 37 C.F.R. §41.37.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest in the appeal is the assignee, Servicios Condumex S.A. de C.V.

II. RELATED APPEALS AND INTERFERENCES

There are no such appeals or interference which will directly affect or be directly affected by, or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

During prosecution of the above-identified application, 17 claims were considered by the Examiner. In an Amendment filed on April 27, 2004, Claims 1-10 have been cancelled; Claims 11-40 were added. In the Office Action dated December 16, 2004, Claims 11-40 were subjected to a restriction requirement by the Examiner. The Examiner restricted Claims 11-27, directed to coaxial cable and Claims 28-40, directed to method for preparing coaxial cable. In the response to Office Action dated March 16, 2005, Appellants elected Claims 11-27 with traverse. In the Office Action dated May 19, 2005, the Examiner maintained the restriction requirement. The Examiner rejected Claims 11-27, directed to coaxial cable and withdrew from consideration, Claims 28-40. In the response to Office Action dated July 17, 2005, Appellants requested that the restriction requirement should be withdrawn and Claims 11-27 remain pending. In the Advisory Action dated September 2, 2005, the Examiner rejected Claims 11-27 and Claims 28-40 were withdrawn from consideration. For purposes of this Appeal, the claims on appeal are Claims 11-27.

A copy of the pending claims on appeal are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

Earlier amendments, claims 11-40 filed on March 16, 2005, all prior to the final rejection have been entered. Claims 11-40 were subjected to a restriction requirement. Appellants elected Claims 11-27, directed to coaxial cables, with traverse. Claims 28-40

were withdrawn from consideration. (A Petition to withdraw Finality of Restriction requirement was filed concurrently with the Appeal Brief)

V. SUMMARY OF THE INVENTION

In its broadest scope, Appellants' invention relates to a dry, water resistant coaxial cable comprising:

a) a metal core conductor element;

b) a dielectric element around the core conductor based on three layers, comprising:

i) a first layer comprising a polymer mixed with an adhesive component and applied onto the core conductor as a uniform film;

ii) a second layer comprising a cellular high expansion polymer on the first layer; and

iii) optionally, a third layer comprising a reinforcement layer on the second layer;

c) a second external conductor surrounding the dielectric element;

d) a second conductor element on the second external conductor, comprising a water penetration protective element; and

e) a protective cover surrounding the second conductor element.

as defined in Claim 11.

The Appellants' specification on page 1, lines 20-25 to page 2, lines 1-4, discloses as follows:

> ....The current methods to prevent water penetration in this type of cables [coaxial cables] focus on the *use of fillers* such as oil dispersed water insoluble materials and stabilizers based on glycol, ester acetate, ethylene glycol, ester or ethylene glycol ester acetate. All these materials show an adequate water protection, the materials have oily adhesive and or characteristic properties. This complicates the use of solvents to clean the cable before connecting it.....

In avoiding the preceding prior art problems, Appellants provide on page 2, lines 21-25, a technique through the design of a dry, water resistant coaxial cable, i.e., **without**

a filler. Rather, a *water penetration prevention element is incorporated* which permits installation, preparation and connection of the coaxial cable in the absence of using solvents or other cleaning agents. The water penetration prevention element is situated between the second external conductor 15 (made of metal or combination thereof) and protective cover 17.

Furthermore, Appellants *overcame* the water penetration problems of the prior art by developing a cable comprising:

a) a first layer conductor comprising an **adhesive** which serves as a moisture blocking element and minimizes the air bubbles which contribute to the *instability* of the characteristic impedance and structural return losses (SRL). The first layer links the conductor to the dielectric element;

b) a second layer which is physically expanded by gas injection and comprises a **swelling agent**. The cellular expansion polymer lowers the dielectric constant through the reduction of polymer mass per length time; the swelling agent controls the swelling material;

c) a third layer which insures the surface uniformity of the intermediate layer and enhances adherence of the aluminum pipe onto the dielectric. The third layer provides water tightness to the swelling dielectric material, improves dielectric surface appearance and permits better control on the dielectric swelling process;

d) a second external conductor made of metal or combination thereof, which is formed in cylindrical pipe and longitudinally welded, extruded or edges overlapped. The second external conductor comprises the water protective element. The water protective element comprises **swellable tapes** and can be placed helically, annularly or longitudinally on the conductor; and

e) the external cover which is made of medium density polyethylene which has precise ratios of antioxidant to insure *best conditions against weathering*, as well as protection against UV rays.

The *advantages* of the cable *design* of presently claimed invention are maximum stress without change in electrical properties, minimum bending ratio, adherence onto the dielectric and characteristic impedance. Additionally, the cable operates at a temperature

between -40 to 80°C. and presents a nominal net weight of 140 Kg/Km.

Thus, the structure/layer configuration, adhesive incorporation, use of swelling agent in the absence of fillers and manipulation of the different layers with various elements and components, to achieve a cable wherein the core conductor of which is made of copper plated aluminum wire, comprising three layers, present an *unobvious* dry, water resistant coaxial cable over the prior art. Moreover, the external conductor is helically surrounded with a pair of blocking threads having an absorption speed of ≥15 ml/g/min and absorption capacity is about 30 ml/g. Finally, the method for preparing the cable, e.g., using several coextrusion and various application techniques and elements, is unobvious over the prior art.

In fulfillment of the foregoing objectives, the present invention provides a dry, resistant coaxial cable without the use of fillers but incorporating in its design a water penetration prevention element which permits installation, preparation and connection of the coaxial cable in the absence of using solvents or other cleaning agents.

There is no disclosure or suggestion in the cited prior art regarding a water penetration protective element as claimed in the present invention. There is no disclosure or suggestion in the cited prior art regarding the distribution of the film of the water penetration protective element which is applied *helically, annularly or longitudinally on second conductor.* The water penetration protective element may be one or more swellable material such as fibers or tapes. There is no disclosure or suggestion in the cited prior art regarding the requirement the water penetration protective element must cover the second conductor, and has a smooth and uniform appearance.

The advantage of the cable design is its use as a trunk or distribution cable in transmission networks for radio frequency signals specifically analog or digital TV transmission signals, energy signals for activating control transmission, data transmission, cellular phone, etc.

From the above, it is the a) *use of the moisture swellable material*; b) the *coating and layering* of the area around the *thin sleeve* and the *core of stranded conductors*; c) the *deposit* of *the swelling material* in a quantity that is proportional to the required thickness of the said film; and d) the *manipulation of application technique* in a

controlled manner to achieve the dry, water resistant cable of the present invention.

Several claim embodiments recite the *configuration, structure, design, diameter and thickness, position and manner of layering of the different elements or parts of the dry, resistant coaxial cable, choice of swellable materials, how the second external conductor is formed, choice of and position of adhesive* on the cable of the present invention.

For example, Claim 11 relates to dry, resistant coaxial cable a metal core conductor element comprising: a) a dielectric element around the core conductor based on three layers, comprising: i) a first layer comprising a polymer mixed with an adhesive component and applied onto the core conductor as a uniform film; ii) a second layer comprising a cellular high expansion polymer on the first layer; and iii) optionally, a third layer comprising a reinforcement layer on the second layer; b) a second external conductor surrounding the dielectric element; c) a second conductor element on the second external conductor, comprising a water penetration protective element; and c) a protective cover surrounding the second conductor element.

Claim 12 relates to metal core selected from the group consisting of copper, aluminum, copper alloy, aluminum alloy, metal plated steel, steel plated, other metals, metal alloys and combinations thereof.

Claim 13 recites first layer and third layer comprise a material selected from a group consisting of polyethylene and polypropylene; wherein the film is thin, continuous and homogeneous; wherein the material is mixed with an adhesive selected from a group consisting of vinyl adhesive, acrylic adhesive and combinations thereof. Note page 5, lines 20-25 of the specification. The film has low dielectric coefficient in order to have maximum signal propagation and minimum attenuation. The *polymer has to be thin as possible to maintain transmission characteristics but its application onto the core conductor has to be continuous and homogeneous because otherwise electric problems will occur such as cable signal reflection.* The main function of the layers is to protect core conductor against corrosion and control adherence between the core and

dielectric.

VI. ISSUE ON APPEAL

The issue on appeal is whether or not claims 11-27, directed to dry, resistant coaxial cable were properly rejected as being unpatentable under 35 U.S.C. §103(a) over Chan et al. (U.S. 5,486,648) in view of Goehlich (U.S. 6,784,371) and further in view of Belli (U.S.6,455,769).

VII. CLAIM GROUPING

The claims do not stand or fall together. For purposes of 35 U.S.C. § 103, claim 11 stands apart from each of claims 12-27. Each of the claim stands apart from each other.

VII. ARGUMENT

Appellants have presented arguments and evidence in their response to establish that the Examiner has failed to establish a *prima facie* case of obviousness. Appellants submit that the Examiner has failed to fully address and consider such arguments and evidence as directed by law.

In order to support a rejection under 35 U.S.C. §103, a basis for a suggestion to make the claimed invention must be found in the prior art. In addition, one of ordinary skill in the art would have had to have a reasonable expectation of success of making the claimed invention. It is submitted that neither of these elements are found in the art cited by the Examiner.

Appellants request the Board to reconsider upon review of all the evidence whether one of ordinary skill in the art would have been motivated to use an adhesive from Goehlich and that they would have been able to do so with a reasonable expectation that the cable would function effectively without significantly affecting the other components contained therein.

The Examiner urged that it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ an adhesive from Goehlich in the

cable of Chan et al. and arrive at the presently claimed invention. The Examiner has not shown prior art that provides motivation or suggestion to incorporate the adhesive. Furthermore, an ability of one of ordinary skill in the art to incorporate the adhesive of Goehlich in the cable of Chan et al. does not lead the artisan to achieve the presently claimed invention because there are several factors to be considered, e.g., a) design of the cable, e.g., choice of elements or layers; b) choice of swellable materials; c) use of encapsulation jacket; or d) use of concentric neutral wires (CN). The preceding elements are discussed below citing cited prior art by the Examiner.

a) Design of cable- Choice of elements or layers

Belli et al., at cols. 1-2, disclose several examples of problems in the prior art associated with water penetration as follows:

> "...Cables for medium- or high-voltage power transmission or distribution generally consist of a metal conductor coated with a first inner semiconductive layer, an insulating layer and an outer semiconductive layer. For some uses, in particular when it needs to be watertight with respect to the exterior, the cable is enclosed inside a metal shield, usually an aluminium or copper shield, consisting of a continuous tube or a metal sheet shaped into a tube and welded or sealed so as to be watertight. ...
>
> During production, *installation or use, breakages and piercings can occur in the metal shield, which allow penetration of moisture or even water into the cable core, with formation of electrochemical trees in the insulation layer, which can cause insulation failure.*
>
> A possible solution to this problem is provided in U.S. Pat. No. 4,145,567. A high-voltage cable is described therein having, around the outside of the outer semiconductive layer, a compressible layer of a foamed plastic material which should prevent external moisture from reaching the insulation layer, thus avoiding formation of electrochemical trees. According to that disclosure, the metal shield preferably maintains some pressure against the compressible layer so that no air or other fluid can travel along the interface between the compressible layer and the metal shield. As further insurance against passage of fluid along the cable, the metal shield can be bonded to the compressible layer. The compressible layer is preferably semiconducting.
>
> *Ruptures* in the metal shield may be caused by the thermal cycles to which the cable is subject as a result of the daily variations in the intensity of the transported current, with corresponding variations in the cable temperature of between room temperature and the maximum operating temperature (for example between 20 C and 90C.). These thermal cycles *cause dilation* and subsequent contraction of the coating layers of the cable, with consequent radial forces exerted on the metal shield. The metal shield can thus *suffer mechanical deformations with formation of empty spaces between the shield and the outer semiconductive layer, which*

may give rise to non-uniformity in the electrical field. At the utmost, these deformations can lead to rupture of the shield, particularly when it is welded or attached by means of sealing, and hence to complete loss of functionality of the shield.

A possible solution to this problem is provided in U.S. Pat. No. 5,281,757, where the metal shield is free to move with respect to the adjacent layers and has the overlapping edge portions bonded together by an adhesive which allows the overlapping edge portions to move relative to each other during the thermal cycling of the cable. A cushioning layer as that disclosed in the above-mentioned U.S. Pat. No. 4,145,567 may be applied between the metal shield and the cable core. If desired, the cushioning layer may be a water swellable tape or a water swellable powder instead of a foamed plastic material.

According to the Applicant's experience, cable designs such as those described in U.S. Pat. Nos. 4,145,567 and 5,281,757 are *not completely satisfactory*. Firstly, the presence of a compressible layer between metal shield and cable core as disclosed in U.S. Pat. No. 4,145,567 is not sufficient to effectively avoid penetration and propagation of moisture or water along the cable. In fact, to obtain an effective water-blocking effect, in U.S. Pat. o. 5,281,757 it is suggested to use, instead of the compressible layer, a water-swellable tape or powder.

However, the *introduction of a water-swellable material under the metal shield would cause serious electrical problems*. In fact, the metal shield, in addition to constituting a barrier against penetration of water and/or moisture, exerts important electrical functions and needs to be in electrical contact with the outer semiconductive layer. A first function of the metal shield is indeed to create a uniform radial electric field inside the cable and, simultaneously, to cancel out the electric field outside the cable. A further function is to support short-circuit currents.

Finally, cables are known in the art which are designed to attenuate the effect of the thermal cycles on the metal shield and at the same time to avoid propagation of moisture and/or water along the cable. These cable are provided with an outer semiconductive layer with V-shaped longitudinal grooves which are filled with a water-swellable material in the form of powder. The V-shaped geometry should ensure electrical contact between the semiconductive layer and the metal shield, on the one hand, and should assist the elastic recovery of the thermal dilations by the material which makes up the semiconductive layer, on the other hand.

However, producing these longitudinal grooves involves the use of a semiconductive layer of high thickness (about 2 mm or more), thereby *increasing the cost and the overall weight of the cable*. In addition, the desired geometry of the semiconductive layer is generally achieved by means of a precise process of extrusion in which appropriately designed dies are used. On the basis of the Applicant's experience, the formation of grooves of irregular geometry is, in practical terms, inevitable during such an extrusion process. These geometrical irregularities can give rise to a non-uniform distribution of the pressure exerted on the metal shield and thus *prevent the semiconductive layer from correctly carrying out its function of elastic absorption of the radial forces*.

Therefore, the cables according to the above prior *art cannot effectively address both the problem of avoiding penetration and propagation of moisture and/or water inside the cable core, and the problem of possible*

deformations or breakages of the metal shield due to the cable thermal cycles, while maintaining a proper electrical contact between metal shield and cable core...."

b) Choice of swellable materials

Chan et al., at cols. 1-2 provide as follows:

"...It is already known to use a *water swellable* material in an electrical power cable to provide a water barrier under the jacket of such cable. For example, U.S. Pat. No. 5,010,209 issued Apr. 23, 1991, discloses use of water swellable particles, namely powder, or of a filling compound with such particles or of a water swellable tape or a combination of these to provide such barrier. However, in the construction *using CN wires*, referred to as wire serving, as shown in FIGS. 6 to 8 of said U.S. Pat. No. 5,010,209, a layer of water swellable particles is always provided. The use of water swellable powder presents a number of disadvantages. When working with such powder, dust particles are spread in the air and they may cause a flash fire in the presence of a flame. Such dust may also cause respiratory problems and/or eye irritation. Moreover, surfaces subject to spills or dusting can become slippery when wet, resulting in *unsafe* work areas.

The use of a layer of water swellable tape over the length of the cable increases the overall diameter and weight of the cable which, in many instances, is undesirable. Also, the cost associated with the application of water swellable tape and powder is significant and will translate into a *higher cost* of the cable. ..."

Belli et al, at col. 2, lines 28-40 provide as follows:

"...The presence of an insulating material such as a water-swellable material under the metal shield cannot ensure electrical continuity between the cable core and the metal shield. Moreover, from the point of view of production and handling, the use of water-swellable tapes or of free water-swellable powders has many drawbacks. Particularly, the use of a water-swellable tape involves an *appreciable increase in costs and a decrease in productivity*, since these tapes are expensive and imply the addition of a wrapping stage to the cable production process. On the other hand, the presence of free-flowing water-swellable powders makes production and installation of the cable quite *cumbersome.....*"

c) Use of encapsulation jacket

Chan et al., at col. 1, lines 37- 67 to col. 2, lines 1-3 provide as follows:

"...It is known that moisture ingress into the insulation can result in the formation of "water trees" which shorten cable life significantly. Water trees are diffused structures or micro-channels with a bush like or fan-like appearance. They grow from defects such as voids, contaminants and semi-conductive shield protrusions in the presence of water and an electric field. The overall protective polymeric jacket, provided over the metallic shield, has a positive effect in minimizing tree growth. However, buried, underground distribution cables sometimes experience mechanical

> damage to the jacket during installation or subsequent accidental dig-ins, allowing ground water to migrate under the jacket. This almost unlimited supply of water can result in the accelerated growth of water trees in the affected section of the cable. In addition, the length of cable exposed to this *accelerated tree growth is increased* due to water migration along the longitudinal axis of the cable. Obviously, the probability of cable failure will increase as the length of the affected section increases. *One approach for limiting the affected area is to use an encapsulating jacket over the concentric neutral (CN) wires* to minimize longitudinal water migration over the entire length of the installed cable. Unlike the conventional "sleeve" jacket, the encapsulating jacket is designed to fill the spaces between the concentric neutral wires. While the encapsulating jacket is an improvement over the "sleeve" jacket in terms of resistance to longitudinal water migration, it is not entirely effective in that some *water leakage* occurs along the slight grooves or indentations made by the concentric neutral wires and/or at the interface between the cable core and the jacket. The water leakage can be observed when the cable is tested in accordance with the water penetration test procedure specified in industry specifications such as International Electrotechnical Commission..."

d) Use of Concentric Neutral wires

Chan et al., at col. 2, lines 27-41 provide as follows:

> "....U.S. Pat. No. 5,146,046 issued Sep. 8, 1992 discloses the use of two water swellable strand-like members, such as yarns, wrapped in opposite helical directions between the relatively supple core wrap layer and the smooth, relatively rigid jacket of a communication cable. The major difference between the communication cable of U.S. Pat. No. 5,146,046 and the electrical power cable of the present invention is that the latter requires the use of CN wires and of a protective plastic jacket as part of the insulation shield system. The use of strand like members such as shown in U.S. Pat. No. 5,146,046, in a communication cable *without* the *CN wires, does not provide any indication of water blocking capability* of such strands in a power cable with a ground shield consisting of CN wires..."

As discussed above, it is an on-going goal in the art to prevent water penetration in the cable art. It is not a matter of incorporation or substitution of an element or layer. For example, Belli et al. disclose *different* configurations, variations and designs of cables where breakages, and piercings can occur, as well as, rupture problems. Belli avoids water swellable materials. Goehlich discloses the disadvantages of water swellable materials under metal which cause serious electrical problem. Chan et al. disclose that water swellable materials provide a number of disadvantages, e.g., cause flash fire, eye irritation or unsafe work areas. Thus, Appellants refute the Examiner's contention that it would be obvious to make substitutions or incorporations in a specific cable configuration and arrive at the Appellants' present invention. These problems in the prior

art can not be solved by simple substitution without experimentation. Rather, it is submitted that the specified claimed modifications in the presently claimed invention must be specifically motivated or suggested by the prior art.

Moreover, even if the references did indicate that such an incorporation may be tried, an "obvious-to-try" standard would be indicated, which is clearly not a sufficient basis for the rejection. The specified claimed modifications must be specifically motivated or suggested by the prior art.

Cited references

Chan et al. (U.S. 5,486,648)

Chan et al. is directed to electric power cables having CONCENTRIC NEUTRAL WIRES (CN) applied helically over the cable core as a metallic ground shield which is then protected with a protective polymeric jacket.

The configuration of the cable of Chan et al. comprises a) a cable having a core (solid or stranded conductor made of copper or aluminum); b) a semi-conductor shield layer made of semi-conductive polymeric compound such as crosslinked polyolefin (XLPE, ethylene propylene rubber (EPR) or ethylene vinyl acetate); c) an insulation layer over shield layer such as polyethylene, XLPE, EPR or the like; d) a semi-conductive insulation shield over the insulation layer and e) concentric neutral wires (CN) as metallic ground shield applied helically over cable core. The presence and several configurations of CN are required in order to prevent water penetration.

Goehlich (U.S. 6,784,371)

Goehlich (U.S. 6,784,371) is directed to power cables comprising a cable core, inner cable sheath, an outer sheath and a sensor. Goehlich has a totally different configuration as compared to the cable of the present invention. The cable contains a sensor for detecting a detectable substance such as water inside the cable. The object of Goehlich is to provide a cable which meets the requirements of *detecting* water in the interstices between the outer sheath, i.e., plastic and an inner sheath, i.e. metal or plastic.

Goehlich comprises a "structured material" between the inner cable sheath and

the outer sheath to allow detectable substance. The invention of Goehlich centers on "structured material" defined as a material with a specific structure which fulfill the requirements regarding the detectable substance (water). See col. 4, lines 25-35. Goehlich discloses a "plethora" of various combinations of "structured material" such as a) swellable material, a water blocking swelling non woven material ; b) self adhesive; c) one or more tapes; d) sputtered tape; d) stripe shaped tape; e) sealing material and combinations thereof.

Belli et al. (U.S.6,455,769)

Belli et al. (U.S.6,455,769) disclose electrical cables for high or medium voltage power transmission in distribution having a semiconductor water blocking expanded layer.

Belli et al. is directed to a cable comprising a conductor (1), an inner semi-conductive layer (2); insulating layer(3); compact semi-conductive non-expanded layer (4); expanded layer (5); metal shield (6) and an outer sheath (7). Belli discloses the use of fillers which the presently invention avoids.

The Appellants will present arguments to show that the Examiner has not met his burden to maintain a prima facie case of unpatentability of the inventions claimed here. The initial burden of presenting a prima facie case of unpatentability based, inter alia, on the prior art rests on the Examiner. *In re Oetiker*, 24 USPQ 2d 1443 (Fed. Cir. 1992). Assuming the burden is met, the burden then shifts to the Applicant to come forward with evidence or argument. Once the Applicant does so, "patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument." Id. (emphasis added, citations omitted).

The discussion which follows will establish that Appellants have provided ample support for patentability of the subject claims. The Examiner has not adequately responded to the Appellants' arguments and evidence to maintain the basis for unpatentability. In a concurring opinion to *In re Oetiker* decision, Justice Plager stated "[t]he burden is on the Commissioner to establish that the Applicant is not entitled under

the law to a patent . . . [even] if, as a matter of law, the issue is in equipoise, the Applicant is entitled to the patent." Id. (citations omitted, emphasis added).

A. The rejection of the claims under 35 U.S.C. § 103 should be reversed because there are no references in the prior art that taken individually or together disclose all of the elements of the present invention, motivate or suggest the present invention or provide a reasonable expectation of success.

Claims 11-27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Chan et al. in view of Goehlich and further in view of Belli.

Appellants have presented arguments and evidence in their response to establish that the Examiner has failed to establish a *prima facie* case of obviousness. Appellants submit that the Examiner has failed to fully address and consider such arguments and evidence as directed by law.

In *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991), the Federal Circuit set forth the standard for *prima facie* obviousness in a method-related opinion, citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). The Court stated that a proper prima facie obviousness rejection requires consideration of two factors:

> 1) whether the prior art would have suggested to one of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and
>
> 2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success .... Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. (emphasis added)

In order to support a rejection under 35 U.S.C.§103, a basis for a suggestion to make the claimed invention must be found in the prior art. In addition, one of ordinary skill in the art would have had to have a reasonable expectation of success of making the claimed invention. Neither of these elements are found in the art cited by the Examiner.

Appellants request the Board to determine upon review of all the evidence whether one of ordinary skill in the art would have been motivated to a) select, pick or choose an adhesive from a multitude of disclosed swelling agents in the secondary reference and incorporate this specific specific adhesive in the cable of the primary reference; b) select a specific adhesive and determine which layer or part of the cable should be coated with the adhesive; c) determine how much and when the coating should be applied; when should edges be overlapping; d) incorporate the second external conductor surrounding the dielectric element; e) incorporate an additional second conductor element on the second external conductor and that they would have been able to do so with a reasonable expectation that the cable would function effectively to: i). permit high speed digital signal transmission without interfering at all with the voice service signal; ii) highly resistant to diaphony; iii) provide tensile strength, i.e., increase of installation span distance; and iv) allow direct use of the cable in overhead and underground installations.

1. **The rejection of the claims under 35 U.S.C. § 103 should be withdrawn because the cited art does not suggest or motivate the claimed invention.**

The Examiner urged that it would have been obvious to one of ordinary skill in the art of cables at the time invention was made to modify the cable of Chan et al. by incorporating an adhesive from Goehlich and arrive at the claimed dry, water resistant coaxial cable of the present invention.

The Examiner alleged in his Office Action dated May 19, 2005 as follows:

> "Chan discloses a dry water resistant coaxial cable which provides improved protection against migration of water (Col. 1, lines 5-16). With respect to claim11, Chan discloses a cable (Fig.3) comprising a metal core conductor element (1),a dielectric element (2-4) around the core conductor (1) on the first layer(2, col.5, lines 15-25) and a third layer(4) comprising a reinforcement layer on second layer (3, col. 5, lines 15-25), a second external conductor (5a) surrounding the dielectric element (6) comprising a water penetration protection element (i.e. swellable yarn) and a protective element (7) surrounding the second conductor element (5a, col. 5, lines 36-46).

However, upon reading of the cited columns in Chan, there was no disclosure or suggestion regarding a dry, water resistant coaxial cable. Rather, Chan et al. discloses at col. 1, lines 5-16 a compound with trademark STRANDBLOCK® was used to prevent migration of moisture. These properties as provided by the Examiner were pulled selectively from the Appellant's **own** claim and specification. The Examiner has not shown prior art that provides motivation or suggestion to incorporate a specific swelling agent from a "multitude of polymers" disclosed in Goehlich. and incorporate "a specific polymer" in the cable of Chan. As discussed above, Goehlich comprises a "structured material" between the inner cable sheath and the outer sheath to allow a detectable substance. The invention of Goehlich centers on "structured material" which can be a sputtered tape, a self adhesive/ a double adhesive, a sealing material or combinations thereof.

Moreover, Chan is directed to electric power cables having CONCENTRIC NEUTRAL WIRES (CN) applied helically over the cable core as a metallic ground shield which is then protected with a protective polymeric jacket. As discussed above, the (CN) configuration of Chan is totally different from that of the presently claimed invention. Chan comprises a cable having a core; a semi-conductor shield layer; an insulation layer over shield layer; a semi-conductive insulation shield over the insulation layer;and concentric neutral wires (CN) as metallic ground shield applied helically over cable core. The CN configurations are required in Chan to prevent water penetration. In contrast, the presently claimed invention does not require concentric neutral wires.

Further, the ability of one of ordinary skill in the art to prepare the cable of the present invention does not lead the artisan to achieve the presently claimed cable because there are several factors to be considered, e.g., 1) position or arrangement of the layer of the swelling agent coating on the cable, 2) which part or parts of the cable should be coated with the swelling agent, and 3) how and when should the cable be coated or the means to coat the parts of the cable. Moreover, even if the references did indicate that such a swelling agent might be tried, an obvious-to-try standard would be indicated, which is clearly not a sufficient basis for the rejection. The specified claimed modifications must be specifically motivated or suggested by the prior art.

The Examiner has not shown prior art that provides motivation or suggestion to incorporate a water penetration protective element in the cable of Chan and arrive at the cable design of the presently claimed invention. In addition, the Examiner has not shown the motivation to choose/select a specific polymer from a multitude of polymers,

As discussed, it is an on-going goal in the art to manufacture dry, water resistant coaxial cable. This *can not* be done by simple substitution without experimentation. It is submitted that the specified claimed modifications must be specifically motivated or suggested by the prior art.

Recent court opinions hold that the references must plainly or clearly suggest the combination of elements. See, for example, *King Instruments Corp. v. Otari*, 767 F.2d 853, 859 (Fed. Cir. 1989). See also *In re Grabiak*, where the Federal Circuit repeated the CCPA's statement in *In re Bergel and Stock*, 130 USPQ 206, 208 (1961):

> The mere fact that it is *possible* to find two isolated disclosures which might be combined in such a way to produce a new product does not necessarily render such production obvious unless the art also contains something to suggest the desirability of the proposed combination [emphasis added].

226 USPQ 870, 872 (Fed. Cir. 1985). Applicants' claims are *not* obvious in view of the above legal standard because the references, when taken together, fail to motivate or suggest the combination. As will be explained below, the cited art fails to provide motivation or suggestion of the present invention for several reasons.

It is impermissible within the framework of 35 U.S.C. §103 to *pick* and *choose* from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 USPQ 416 (Fed. Cir. 1986). Courts have long cautioned that consideration must be given "where the references diverge and teach away from the claimed invention". *Akzo N.V. v. International Trade Commission,* 1 USPQ 2d 1241, 1246 (Fed. Cir. 1986).

In the present instance, the Examiner improperly selected disclosures from the cited prior art without finding the motivation or suggestion necessary for one of ordinary skill in the art to combine them.

In summary, none of the cited references supplies the requisite motivation or suggestion to prepare a cable of the presently claimed invention with modified tensile strength, highly resistant to diaphony, highly crush and moisture resistant, and provides high speed digital services link, as well as analog services. It is submitted that the specified claimed modifications must be specifically motivated or suggested by the prior art.

a. The cited art fails to provide a motivation or suggestion because the invention contains elements nowhere found or suggested in the prior art.

Appellants submit that Belli provides no intention to provide a cable without the use of fillers. Nothing in Belli discloses or suggests the presently claimed invention regarding the use of swellable polymer. If anything, Belli teaches away from the claimed invention.

In contrast, the present invention **required** the swelling agent without the use of a filler. The cable provides high speed digital signal transmission *without* interference from voice service signals and use of additional electronic circuits to separate signals.

Moreover, Belli's problems are directed to high voltage and medium voltage transmission. Thus, even if Belli was considered, the disclosure would not suggest the invention to one skilled in the art. If the prior art does not appreciate the existence of the problem solved by the invention, the Applicants' recognition of the problem is in itself, **strong evidence of non-obviousness of the present invention**. *In re Nomiya*, 184 USPQ 607 (CCPA 1975).

b. The cited art fails to address the problem with which the presently claimed invention is concerned

The present application presents a case where the cited art fails to articulate the problem being solved by the claimed combination. As explained above, there is no indication in the cited art regarding the use of swelling agent in a manner claimed by the presently claimed invention and achieve the synergistic properties of the cable of the present invention.

The Appellants submit that the Examiner failed to establish a *prima facie* case of obviousness. The issue is whether it is proper to combine the teachings of Chan in any manner with Goehlich and further with Belli. It remains the Appellants' position that although Chan is relevant to cables, the coaxial cable structure configuration of the present invention is different and unobvious over that of Chan. The disclosure of Goehlich was intended to provide a sensor for detecting detectable substance.

The problems addressed and solved by the Belli and Goehlich are not similar to the problems addressed by Chan. Appellants submit that Goehlich is directed to "structured materials" which can not be sufficiently attenuated to the cable design of Chan and is not properly combineable therewith.

The cable art area of Chan is so different to be non-analogous because it contains concentric neutral wires. The combination of references from non-analogous art has long been held to be improper. See MPEP 2141.01(a). *In re Oetiker*, 24 USPQ 2d 1443 (Fed. Cir. 1992) and *In re Clay*, 23 USPQ 2d 1058 (Fed. Cir. 1992). In *Clay*, the court laid out the criteria as follows:

"Two criteria have evolved for determining whether prior art is analogous: 1) whether the art is from the same field of endeavor regardless of the problem addressed; and 2) if the reference is not within the field of inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. *In re Demniski*, 230 USPQ 313, 315 (Fed. Cir. 1986); *In re Wood*, 202 USPQ 171, 174 (CCPA 1979).

Applying the case law to the present invention, it is submitted that Goehlich is a

non-analogous art for the following reasons:

First, in Goehlich, the field of endeavor is in the method of detecting water in the interstices between the outer sheath and inner sheath;

Second, the invention of Goehlich provides a plethora of "structured materials" for detecting water in the interstices between the outer sheath and inner sheath;

Third, the objective of Goehlich is to provide a water sensor such that water is halted from entering and damaging the sheaths.

Fourth, as disclosed in Goehlich, the invention of Goehlich can not be compared to an armored cable which prevents damage of metal sheath by measures of construction, the armoured cable has to be bigger, can allow only smaller length on a drum; needs more joints and has a deteriorated current carrying capacity. Note col. 8, lines 60-67

From the above, the Appellants submit that the field of endeavor of the present invention is different from that of Goehlich. Appellants submit that the Goehlich reference is not reasonably pertinent to the problem solved by the Appellant.

Appellants submit that merely because a swellable material namely, polysodium acrylate as disclosed in Chan which comprises concentric neutral wires to prevent water penetration, one of ordinary skill in the art would have picked, chosen or selected this specific polymer and determined that this specific swelling agent polymer can be incorporated with the polymer of Goehlich and achieve the unexpected properties (as discussed above) of the presently claimed invention.

This is a classic situation in which no motivation or suggestion is found in the prior art. See, for example, *In re Rinehart*, 189 USPQ 143, 149 (CCPA 1976) where the CCPA clarified that it was improper to maintain an obviousness rejection where "the problem is nowhere alluded to in either . . . [reference] and of course no suggestion of a solution appears in either reference." In the present case, as in Rinehart, it is improper, and indeed illogical, to find a motivation in the prior art to combine elements to solve a problem when the problem being solved was unknown.

Where the prior art does not appreciate the existence of the problem solved by the invention, the Applicant's recognition of the problem is, in itself, strong evidence of the

non-obviousness of the invention. In re *Nomiya*, 184 USPQ 607, 612-613 (CCPA 1975); *In re Sponnable*, 160 USPQ 237, 243 (CCPA 1969).

Courts have held that the prior art should disclose or suggest the problem with which the invention is concerned. "That the claimed invention may employ known principles does not by itself establish that the invention would have been obvious." *In re Lindenmann*, 221 USPQ 488 (CCPA 1984).

There is no motivation or suggestion in the prior art to render the claimed invention obvious. In the present case, there is nothing in the prior art which discloses or suggests the problem with which the claimed invention is concerned.

c. The Examiner has chosen to improperly ignore the Appellants' limitation in the presently claimed process.

The present invention is directed to a dry, water resistant coaxial cable comprising: a) a metal core conductor element; b) a dielectric element around the core conductor based on three layers, comprising: i) a first layer comprising a polymer mixed with an adhesive component and applied onto the core conductor as a uniform film; ii) a second layer comprising a cellular high expansion polymer on the first layer; and iii) optionally, a third layer comprising a reinforcement layer on the second layer; c) a second external conductor surrounding the dielectric element; d) a second conductor element on the second external conductor, comprising a water penetration protective element; and e) a protective cover surrounding the second conductor element.

Claim 22 recites that the second external conductor is formed in cylindrical pipe and longitudinally welded, extruded or the edges overlapped and the external conductor has a thickness of at least 0.34 mm and diameter on the pipe is 13.70 mm±0.10 mm. Claim 23 recites that the water protection element comprises swellable tapes and can be placed helically, annularly or longitudinally on the conductor.

In effect, the Examiner has viewed the Appellants' own Disclosure as "prior art" under 35 USC § 103, which it is not. In order to ignore this limitation as immaterial, the Examiner must also improperly assume that the limitation to serves no useful purpose.

In *In re Kuehl*, 177 USPQ 250 (CCPA1973), the Court considered the "invention as a whole" to include the new zeolite as well as a process utilizing the new zeolite. The Board of Appeals which required the Appellant in *Kuehl* to show unexpected results in the use of the new zeolite, confused the "invention as a whole"with "the prior art". This requirement was considered by the Court as an improper requirement based upon the use of the hindsight.

Similarly, in the instant case, it is submitted that the Examiner has confused the terms "prior art" and "subject matter (invention) as a whole" as used in 35 U.S.C. § 103, specifically, to consider "second external conductor is formed in cylindrical pipe and longitudinally welded, extruded or the edges overlapped" or "water protection element material as applied helically, annularly or longitudinally on the conductor" as a non-critical limitation or as part of the "prior art" for the purposes of applying the statute. Accordingly, the Examiner's rejection incorrectly treats the claim limitations as part of the prior art. The correct application of the test of §103 requires that the claims not be judged against any prior art other than the references cited and applied by the Examiner.

In *In re Pleuddemann,* 15 USPQ 2d 1738 (Fed Cir. 1990), a new class of coupling agents was discovered upon which the Patent Office had granted claims on articles made utilizing said coupling agents. Pleuddemann appealed claims directed to a use of new coupling agents for bonding or priming. The appealed claims recited the use of a novel and non-obvious class of organosilane compound. The Court again reversed the Board of Appeals on the basis that the Board had erroneously considered that in order for the process of use claims to be patentable, the result of the claimed process or method should be unpredictable in order to render the process non-obvious. The Court in *Pleuddemann* found the same flaw in the Board's reasoning as it found in *Kuehl* in that the Board presumed the Appellant's group of silane compounds to be "prior art". Similarly, the Examiner here has considered the Appellants quantitative method to be "prior art".

The Examiner has used the Appellants' specification teaching as though it were "prior art" to reject the Applicants' claims directed to a dry water resistant coaxial cable. The Federal Circuit held that the use of *per se* rules is improper in applying the test for obviousness under 35 U.S.C. §103. Rather, §103 requires a highly fact dependent analysis involving taking the "claimed subject matter as a whole" and comparing it to the prior art. To support a rejection under §103, the collective teachings of the prior art must have suggested to one of ordinary skill in the art that, at the time the invention was made, Appellants' claimed invention would have been obvious. It has been held that there simply was no suggestion or motivation in the prior art to obtain the unobvious products to which the claims were limited. Consequently, the rejections were overturned based upon §103.

In interpreting "a claimed invention as a whole", consideration of all the claim limitations is required. Thus, the language in a claim which recites "second external conductor is formed in cylindrical pipe and longitudinally welded, extruded or the edges overlapped" or "water protection element material is applied helically, annularly or longitudinally on the conductor"in an unobvious product must be treated as a "material limitation" and a motivation regarding this limitation must be present in the prior art for a §103 rejection to be sustained.

The invention is directed to a manipulation of the incorporation of a water protection element material and second external conductor to produce the dry, water resistant cable of the presently claimed invention with unexpected properties. The issue is whether the prior art cited by the Examiner in no way suggests or teaches the modification. Clearly, in view of the improved cable, no such suggestion is made.

d. The Examiner has improperly used Appellants' own teaching to construct the obviousness rejection

Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes inventor disclosure as a blueprint for piecing together prior art to defeat patentability-the essence of hindsight. In re *Dembiczek*, 175 F.3d 994 (Fed. Cir. 1999).

There is no motivation or suggestion on the part of one of ordinary skill in the art at the time the invention was made to incorporate the adhesive of the secondary reference Goehlich, as well as the swellable material of Belli et al. in the cable of Chan *et al.* and achieve the cable of the presently claimed invention.

Appellants argue that there is no motivation to combine the teaching of Chan et al. with Goehlich and further in view of Belli and arrive at the present invention for the following reasons.

First, Chan et al. provides a cable comprising various embodiments of concentric neutral wires (CN) and water swellable polymers. There is no disclosure or suggestion in the present invention regarding concentric neutral wires.

Second, Goehlich provides a multitude of "structured material" embodiments which include swellable material, adhesives, tapes, sticky plate (foamed under crosslinked acrylic) or sealing materials.

Third, Belli is directed to electrical cable having semiconductive water blocking expanded layer. The problems addressed by Belli is to use high voltage or medium voltage transmission.

Belli's intention is to prepare electrical cables such that the expanded layers are **combined with fillers**. Note col. 6, lines 49-57. It is submitted that there is no motivation or suggestion to incorporate the embodiments of Belli in the cable of Chan (which uses concentric neutral wires to avoid water) and arrive at the presently claimed invention because the **dry, water resistant coaxial cable of the present invention does not use fillers**. This was discussed at the outset of the discussion of SUMMARY OF INVENTION on page 2. As a matter of fact, Belli teaches away from the present invention.

Fourth, Belli et al. disclose the use of fillers and avoid the use of water swellable tapes or powders. Note col. 6, lines 49-51. In contrast, Appellants provide a dry, water resistant coaxial cable in the absence of fillers.

Fourth, Belli et al. disclose the disadvantages of using water swellable tapes or powders. The cable of the present invention employs water swellable tapes.

Fifth, Belli et al. disclose use of expanded layer under the metal shield to

effectively block moisture and/or water, thus avoiding the use of water-swellable tapes or of free water-swellable powders. The Appellants' dry, water resistant coaxial cable employs a second external conductor (15) made of metal, e.g., aluminum, copper or combinations thereof, contains the water protective element (16).

Belli et al. disclose a "multitude" of expanded layers for the electrical cable that is used for high voltage power transmission or distribution. Note cols. 5-6.

The adhesive disclosed in Goehlich occurs in a "plethora" of various different combinations such as tapes, self adhesive, sputtered adhesive, sealing material or swellable material (non woven material).

A person of ordinary skill in the art upon reading Belli, will have to select, pick, choose and determine which expanded polymer he should use as shown at cols. 3-6. for example, polyolefins, copolymers of different olefins, polyesters, polycarbonates, polysulfonates, polypropylene, polyethylene, ethylene vinyl acetate, phenol resins, urea resins, fillers, a multitude of polymers, combination of a multitude of polymers or a combination of all the different reagents in preparing an expanded polymer. A person of ordinary skill in the art would *not* choose a single polymer from a multitude/plethora of selections and incorporate it in the cable of the present invention and achieve unexpected results.

Moreover, a person of ordinary skill in the art would have to determine a) how to incorporate the swelling agent in the cable of Chan; b) which position or arrangement should the water swelling agent be incorporated in the cable; c) which part or parts of the cable should be coated with the swelling agent; and d) when should the swelling agent be incorporated.

Finally, a person of ordinary skill in the art upon reading the teaching or disclosure of Chan et al., Goehlich and Belli et al., will have to determine the use of filler, which adhesive or CN embodiment, or expanded polymer or water swellable polymers to use. A person of ordinary skill in the art would *have to pick and choose* an adhesive, a CN embodiment or water swellable polymer from a multitude/plethora of selections and incorporate them in the cable of Chan et al. in order to achieve unexpected results of the present invention.

It is submitted that there is no motivation or suggestion in the prior art to pick and choose a specific adhesive of Goehlich, a specific CN embodiment of Chan et al. or a specific water swellable polymers or expanded polymer of Belli, from a multitude of adhesive embodiments, CN embodiments or water swellable polymers or expanded polymer embodiments, choose a specific polymer from a "plethora" of polymers or catalyst, fillers in Goehlich and particularly use them for the purpose of preparing the cables of the present invention. In re *Albrecht*, 435 F.2d 908, 911, 168 USPQ 293, 296 (CCPA 1971).

From the above, there is no motivation or suggestion on the part of one of ordinary skill in the art at the time the invention was made to incorporate the adhesive of Goehlich in the cable of Chan et al. and further in view of the plurality of layers of Belli and achieve the cable of the presently claimed invention. There is no motivation or suggestion on the part of one of ordinary skill in the art at the time the invention was made to incorporate the polymer of the secondary reference Belli in the cable of Chan *et al.* and achieve the cable of the presently claimed invention. The *only* possible motivation would have been supplied by the Appellants' own specification, which of course would be proscribed as hindsight application of Appellants' own teachings.

It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This Court has previously stated that "[one] cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fritch*, 23 USPQ 2d 1780 (Fed. Cir. 1992).

The *only* teaching linking (nexus) the adhesive of Goehlich *et al.* is found in the presently claimed invention. Moreover, even if the references did indicate that such a polymer might be tried, an *obvious-to-try* standard would be indicated, which is clearly *not* a sufficient basis for the rejection. It is submitted that the specified claimed modifications must be specifically motivated or suggested by the prior art.

Thus, the Examiner improperly used the Appellants' own teachings in an attempt to show obviousness of the present invention.

From the above, Appellants argue that there is no motivation to combine the teaching of Goehlich or Belli et al. with Chan and arrive at the present invention for the following reasons.

Thus, the Examiner improperly used the Appellants' own teachings in an attempt to show obviousness of the present invention.

The Examiner stated the following rejection:

> "The Examiner argued that Chan et al. discloses a "dry water resistant coaxial cable" which provides protection against migration of water. Chan discloses a cable comprising a metal core conductor (1), a dielectric element (2-4) around core (1) on the first layer and a third layer (4) comprising a reinforcement layer on second layer surrounding the dielectric element; a second conductor element (5a) on the second external conductor (6) comprising water penetration protection element (i.e. swellable yarn) and a protective element (7) surrounding the second conductor element...
> Chan doesn't necessarily disclose the first layer comprising an adhesive nor the adhesive being selected from the group consisting of vinyl adhesive, acrylic adhesive and combinations thereof (claim 13) nor the adhesive selected from the group consisting of ethylene acrylate acid, ethylene vinyl acid and combinations thereof (claim 20) nor the absorption capacity of more than 30 ml/g (claim 24).
> Goehlich teaches a cable (Fig.1-4) comprising a cable core being surrounded by a plurality of insulating layers which overcome the shortcoming of the prior art cables by preventing water intrusion resulting onfrom damage outer sheath to travel longitudinally... Goehlich teaches that adhesive component may be selected from ethylene acrylate acid. (Col. 5, lines 8-20)... It would be obvious to one of ordinary skill in the art of cables at the time the invention was made to modify the insulation layers of Chan to comprise the adhesive component configuration as taught by Goehlich because Goehlich teaches that such configuration overcomes damage outersheath to travel longitudinally thereby eliminating the possibility of internal components...."

As a preliminary matter, Appellants submit that the Examiner used the presently claimed invention as a blueprint for his Office Action rejection. There is no disclosure or suggestion in Chan et al. regarding a "dry, water resistant coaxial cable". There is no disclosure or suggestion in Chan et al. regarding a cable comprising three layers as claimed in the present invention. There is no disclosure or suggestion in Chan et al.

regarding a first and third layer comprising a reinforcement layer as claimed in the present invention.

In fact, Chan et al. discloses a cable comprising: cable (1); semiconductor shield (2); insulation (3); insulating shield (4); water swellable yarn (5); concentric neutral (CN) wires (6); and an encapsulating jacket (7). The water swellable yarn of Chan et al. is helically wound over (4), under CN wires which has a lay opposite to that of CN so it crisscrosses. Thus, disclosure from Chan et al. provides **no intention** for additional protection to be water resistant. If anything, Chan et al. teaches away from the claimed invention.

In response to Examiner's argument, Goehlich et al. did not specifically disclose ethylene acrylate. Rather, Goehlich et al. provide a list of a "multitude" of generic polymers – sticky plastic (cross linked acrylic), sputtered adhesive, self-adhesive, one sided adhesive, swellable material (water blocking non woven material), acrylates, methacrylate, polyurethane, epoxy resin, silicone, etc.

The presently claimed invention is directed to a dry, water resistant coaxial cable comprising a metal core conductor element; a dielectric element around the core conductor based on three layers, comprising: a) a first layer comprising a polymer mixed with an adhesive component and applied onto the core conductor as a uniform film; b) a second layer comprising a cellular high expansion polymer and a swelling agent on the first layer; and c) optionally, a third layer comprising a mixed polymer reinforcement layer and adhesive on the second layer. Moreover, the cable further comprises a second external conductor surrounding the dielectric element; a second conductor element on the second external conductor, a water penetration protective element; and a protective cover surrounding the second conductor element. There is no disclosure or suggestion in the present invention regarding concentric neutral wires (CN) of Chan et al.

A primary object of Goehlich is to provide a cable which meets the requirements of detecting water in the interstice between outer sheath i.e., plastic) and inner sheath (i.e., metal or plastic). This object was solved by Goehlich by providing a cable comprising: a) a cable core, b) an inner cable sheath, c) an outer sheath and d) a sensor, which is extending along the cable for detecting a detectable substance inside the cable.

Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes inventor disclosure as a blueprint for piecing together prior art to defeat patentability is the essence of hindsight. In re *Dembiczek*, 175 F.3d 994 (Fed. Cir. 1999).

Applying the above caselaw to the present application, it is submitted that there is no evidence of suggestion, teaching or motivation to combine the teaching of Goehlich with the disclosure of Chan et al. and arrive at the presently claimed invention.

Goehlich's problems are directed to avoiding the presence of water. Neither Goehlich or Chan specifically addresses the types of or particular problems to which the claimed invention is confronted with, e.g., problems with presence of fillers which complicate the use of solvents when cleaning the cable. Thus, even if Goehlich or Chan were considered, they would not suggest the invention to one skilled in the art.

If the prior art does not appreciate the existence of the problem solved by the invention, the Appellants' recognition of the problem is in itself, **strong evidence of non-obviousness of the present invention**. *In re Nomiya*, 184 USPQ 607 (CCPA 1975).

It is submitted that the Examiner has not shown a prima facie case of unpatentability of the presently claimed invention over Chan et al. in view of Goehlich.

> A. The Examiner urged that "it would have been obvious to one having ordinary skill in the art of cables at the time the invention was made to modify the cable of modified Chan to comprise a swelling agent configuration as taught by Belli because Belli teaches that such configuration overcomes the shortcomings of prior art cables by effectively addressing both the problem of avoiding penetration and propagation of moisture and/or water inside the cable core, the problem of possible deformations or breakages of the metallic shield due to cable thermal cycles, while maintaining a proper electrical contact between the metal shield and the cable core....."

It is submitted that the Examiner's arguments and reliance upon Belli were misplaced because of the following reasons:

Belli discloses the use of fillers. Note col. 6, lines 49-51 as follows.

> "...The polymer material, i.e., expanded layer can be mixed with the semiconductive filler, the water swellable material and other optional conventional

additives according to methods known in the art
....(emphasis added)"

As disclosed in the specification, Appellants have developed a technique through the design of a dry coaxial cable *without the use of fillers*. Note page 2, last paragraph. Thus, Belli teaches away from the present invention. Accordingly, there is no motivation or suggestion to combine Belli with Chan and arrive at the presently claimed invention.

Moreover, it is impermissible to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 U.S.P.Q. 416 (Fed. Cir. 1986).

Applying the case law to the present invention, it is submitted that the object of the present invention is to prepare a dry water resistant coaxial cable without the use of fillers. Moreover, the presently claimed invention has a different configuration as compared to configuration of Belli et al.

The Appellants urge that the Examiner as a matter of law erred by combining prior art references based on incorrect teaching-suggestion motivation test.

There must be some specific understanding or principle within the knowledge of skilled artisan that would have motivated one with no knowledge of the invention to make the combination in the manner claimed. *In re Kotzab*, 217 F.3rd at 1371.

Based on the nature of the problem to be solved, express teachings of prior art or knowledge of one of ordinary skill in the art, the Examiner is required to make specific finding as to whether there was a suggestion or motivation to combine teachings of Goehlich with Chan et al and further in view of Belli et al. in a particular manner as claimed in the present invention. The Examiner has not shown such specific finding as to suggestion or motivation from the prior art.

It is submitted that the nature of the problem to be solved may under appropriate circumstances provide suggestion or motivation to combine prior art. However, the test **requires** nature of the problem to be solved be such that it would have led a person of ordinary skilled in the art to combine prior art teachings in a particular manner claimed. See *In re Rouffert*, 149 F.3rd 1357.

In this case, Goehlich does not address the same problem. The objective of Goehlich is to design a cable which can detect water. It has a simple cable combination comprising a cable core, an inner sheath, a sensor, a structured material and an outer sheath. The Examiner selected an adhesive from a multitude of "structured material" embodiments.

The Examiner's reliance on the problem associated with Belli fails to provide the sufficient motivation to combine the disclosure of Belli with Chan et al. Belli discloses the use of fillers. Moreover, Belli discloses a multitude of expanded polymers and water swellable polymers. Belli does not address the problem to be solved by the present invention. Rather, it suffers from the problem. The Examiner did not explain how suffering from the problem addressed by Belli would have specifically motivated one of ordinary skill in the art to combine the water swellable polymers to the multitude of CN embodiments of Chan et al. and arrive at the present invention.

In other words, solving the water penetration problem of Belli is a different task where it uses an expanded polymer comprising the water swellable polymer as compared to the present invention. What is more, the present invention does not relate to the use of expanded polymer to comprise the water protection element. Rather, it uses a second external conductor made of metal. The present invention is directed to a dry water resistant cable which comprises different layers or elements arranged in a configuration that performs different functions and prevent water penetration. Therefore, Belli does not address the problem of the present invention.

Appellants submit that there is no motivation or suggestion that one of ordinary skill in the art would pick and choose a certain embodiment, from a plethora of ingredients/embodiments or polymers, incorporate these teaching in the presently claimed invention and achieve the desired results as claimed in the present invention.

Accordingly, Appellants request the reversal of the rejection of the Claims 14-15, 19, 21-22 and 26-27 under 35 USC§ 103 (a) as being unpatentable over Chan et al. (U.S. 5,486,648) in view of Goehlich (U.S. 6,784,371) and further in view of Belli (U.S.6,455,769).

e. The cited prior art fails to provide a motivation or suggestion because Belli et al. is teaches away from the present invention.

A critical issue is whether Belli constituted relevant prior art. A relevant prior art is defined by the nature of the problem confronting the would be inventor.

"When determining patentability of a claimed invention which combines two known elements, the question is whether there is something in the prior art to suggest the desirability, and thus, the obviousness of making the combination" *Ecolochem Inc. v. Southern Cal. Edison Co.*, 227 F.3d 1361, 1372 (Fed. Cir. 2000), *cert. denied*, 532 U.S. 974 (2001) quoting *In re Beattie*, 974 F.2d 1309, 1311-1312 (Fed. Cir. 1992) quoting *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co*, 730 F.2d 1452, 1462 (Fed. Cir. 1984)).

From the above caselaw, it is submitted that there must be something in the prior art to suggest the "desirability" of using a swelling agent of Belli in the cable of Chan. However, Belli et al. is directed to swelling agents which contain fillers. Goehlich is directed to a multitutde of structured materials. Moreover, it discloses a multitude of polymers, a plethora of a combination of multitude of polymers.

The Federal Circuit's decisions on obviousness follow *United States v. Adams*, 383 U.S. 39 (1966). In *Adams*, the patented product (a battery) consisted of a combination of old elements that were well known in the prior art 383 U.S. at 51. The Court nonetheless held that the patented battery was nonobvious. The Court held that known disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness." 383 U.S. at 52. The Court also noted that "[i]f such a combination of [old battery elements] is novel, the issue is whether bringing them together as taught by Adams was obvious in light of the prior art." 383 U.S. at 50. The Federal Circuit has followed the Court's holding in *Adams*. See e.g., *Kahn v. General Motors Corp.*, 135 F.3d 1472 (Fed. Cir. 1998, *cert. denied*, 525 U.S. 875 (1998) ("In determining obviousness, the invention must be considered as a whole"); *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994) ("a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely

to be productive of the result sought by the Applicant") citing *Adams*, 383 U.S. at 52.

A person of ordinary skill in the art not only should have had some motivation to combine the prior art teaching but some motivation to combine prior art teaching in a particular manner claimed. *In re Kotzab*, 217 F.3rd 1365 (Fed. Cir. 2000).

Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes inventor disclosure as a blueprint for piecing together prior art to defeat patentability is the essence of hindsight. In re *Dembiczek*, 175 F.3d 994 (Fed. Cir. 1999).

It is submitted that the Examiner improperly combined the teaching of Chan with Goehlich and Belli et al. There is no disclosure, teaching or suggestion in Goehlich, Chan or Belli regarding the position, layering or coating of the cable with the swelling agent/adhesive without the use of fillers. There is no disclosure or suggestion in Belli, Goehlich or Chan regarding the parts of the cable that should be coated with the swelling agent. There is no disclosure or suggestion in Goehlich, Chan or Belli regarding how the coating of swelling agent should be applied. There is no disclosure or suggestion in Belli Chan or Goehlich regarding the unexpected properties achieved by the cable of the presently claimed invention.

From the above, the Examiner has not shown any prior art to show a motivation or suggestion in the prior art to show the incorporation of the teaching of Belli or Goehlich in the disclosure of Chan and arrive at the presently claimed invention. In accordance with *In re Oetiker*, *supra*, the Examiner has not met the requisite burden of proof as required by a prima facie case of obviousness.

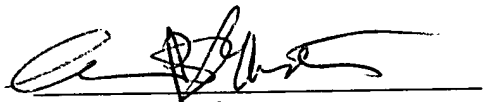
IX. CONCLUSION

Appellants have presented the above reasons why the claims are not rendered obvious by the cited references. Each of these arguments alone is sufficient to establish that a *prima facie* case of unpatentability has not been made. In combination, they present a compelling argument that the claims are patentable over the prior art. It is submitted that the Examiner has not presented sufficient arguments or reasoning to contradict the evidence provided by Appellants that the prior art fails to provide a

suggestion for providing an improved dry water resistant coaxial cable and method of manufacture thereof with unexpected properties.

WHEREFORE, in light of the arguments and authorities presented above, reversal of the Examiner's action in rejecting claims 11-27 and allowance thereof are respectfully urged.

Respectfully submitted,



Carmen Pili Ekstrom
Reg. No. 34,981
Attorney for Appellants

LAW OFFICE OF CARMEN PILI EKSTROM
727 Sunshine Dr.
Los Altos, CA 94024
650 960-1936

Filed: March 21, 2006

APPENDIX

APPEALED CLAIMS

11. A dry water resistant coaxial cable comprising:

a metal core conductor element;

a dielectric element around the core conductor based on three layers, comprising:

a first layer comprising a polymer mixed with an adhesive component and applied onto the core conductor as a uniform film;

a second layer comprising a cellular high expansion polymer on the first layer; and

optionally, a third layer comprising a reinforcement layer on the second layer;

a second external conductor surrounding the dielectric element;

a second conductor element on the second external conductor, comprising a water penetration protective element; and

a protective cover surrounding the second conductor element.

12. The dry water resistant coaxial cable according to claim 11 wherein the metal core conductor element is selected from a group consisting of copper, aluminum, copper alloy, aluminum alloy, metal plated steel, steel plated, other metals, metal alloys and combinations thereof.

13. The dry water resistant coaxial cable according to claim 11 wherein the first layer and third layer comprise a material selected from a group consisting of polyethylene and polypropylene;

wherein the film is thin, continuous and homogeneous;

wherein the material is mixed with an adhesive selected from a group consisting of vinyl adhesive, acrylic adhesive and combinations thereof.

14. The dry water resistant coaxial cable according to claim 11 wherein the second layer comprises a swelling agent and a high expansion polymer selected from a group consisting of low density polyethylene, medium density polyethylene, high density polyethylene, polypropylene, polyester and combinations thereof.

15. The dry water resistant coaxial cable according to claim 14 wherein the swelling agent is selected from a group consisting of azodicarbonamide, p-toluene, sulphonyl hydrazide, 5-phenyl tetrazol and combinations thereof.

16. The dry water resistant coaxial cable according to claim 11 wherein the second external conductor element comprises a material selected from a group consisting of aluminum, copper, aluminum alloy, copper alloy, other metals and metal alloy and combinations thereof.

17. The dry water resistant coaxial cable according to claim 11 wherein the water penetration protective element comprises one or several swellable fibers or tapes selected from a group consisting of polyester threads, polyacrylamide, polyacrylic acid, polyacrylate fibers, other swellable fibers and combinations thereof.

18. The dry water resistant coaxial cable according to claim 11 wherein the protective cover comprises a polymer selected from a group consisting of low density polyethylene, medium density polyethylene, high density polyethylene and combinations thereof.

19. The dry water resistant coaxial cable according to claim 11, wherein the core conductor comprises a copper plated aluminum wire, having a uniform circular cross section of at least 3.15 ±0.3 mm diameter.

20. The dry water resistant coaxial cable according to claim 11, wherein the adhesive component is selected from a group consisting of ethylene acrylate acid, ethylene vinyl acid and combinations thereof.

21. The dry water resistant coaxial cable according to claim 11, wherein the second layer is a_ reinforcement layer and is applied onto the core conductor, and shows a better watertightness to the dielectric element which is swellable, and improves its superficial appearance; wherein it comprises at least 13.0 ± 0.10 mm diameter.

22. The dry water resistant coaxial cable according to claim 11, wherein the second external conductor comprises a material selected from a group consisting of aluminum, copper, braided mesh of metal, alloy metal, other metals and combinations thereof;
wherein the material is formed in a cylindrical pipe and can be longitudinally welded, extruded or the edges can be overlapped;and
wherein the external conductor has a thickness of at least 0.34 mm and the diameter on the pipe is at least $13.70 \text{ mm} \pm 0.10$ mm.

23. The dry water resistant coaxial cable according to claim 11, wherein the water penetration protective element comprises swellable tapes which can be placed helically, annularly or longitudinally on said conductor.

24. The dry water resistant coaxial cable according to claim 11, wherein the water penetration protective element has an absorption speed of about 15 ml/g per minute and an absorption capacity of more than 30 ml/g.

25. The dry water resistant coaxial cable according to claim 18 wherein the protective cover is medium density black polyethylene.

26. The dry water resistant coaxial cable according to claim 18 wherein the diameter of the protective cover is about 15.5 mm $\pm$ 0.10 mm with about 0.67 mm $\pm$ 0.02 mm thickness.

27. The dry water resistant coaxial cable according to claim 25, further comprising antioxidants.

EVIDENCE APPENDIX

No Declarations under 37 C.F.R. §§ 1.130, 1.131 or 1.132 were filed.

RELATED PROCEEDINGS APPENDIX

Appellant is not involved in Board of Appeal or Interference proceedings as shown in section II of Appeal Brief.